ATARI COMPUTER ENTHUSIASTS

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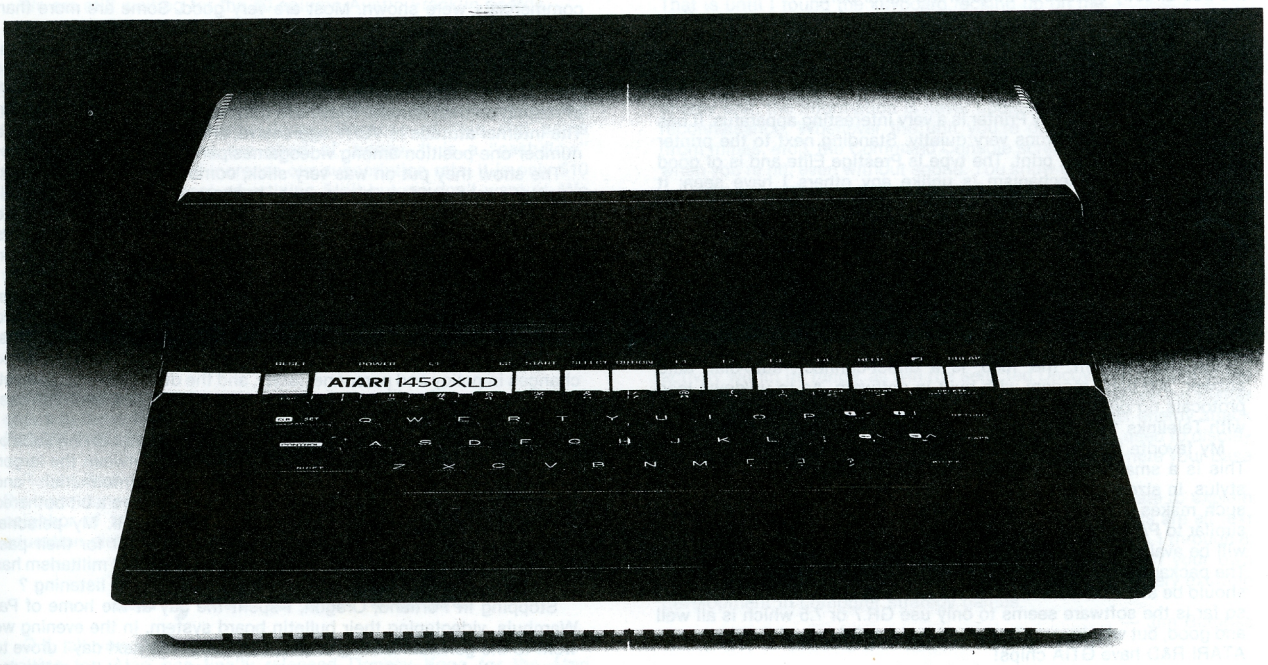

RUTH'S PILOT

PREPARING FOR TAKE-OFF IN ATARI PILOT

by Ruth Ellsworth

This month begins a series of articles about ATARI PILOT for beginning pilots. This article will discuss the AUTO , REN, T:, A:, AND E: commands. More advanced programmers may want to skip to the tanagram type program at the end of this article.

Why are the lines of programs numbered?

My younger children like to think programming is a little like going on a treasure hunt. A program is a list of instructions telling the computer what to do and when to do it. On a treasure hunt it is necessary to follow the directions in the order they are given to find the treasure. Numbering the lines of a computer program tells the computer (like the clues in a treasure hunt the order and when each direction is to be followed.

Instructions given to the computer which are not numbered are understood by the computer as being in 'the immediate mode' or to be performed at once. Such instructions are not a program, and cannot be repeated unless they are retyped into the computer.

Program numbering

Any numbers can be chosen to be used to type in a program, however for the instructions to run in order they must be numbered consecutively (lowest to the largest). It does not matter in what order the numbers are typed when the program is written, the computer will arrange the numbers consecutively and follow them in that order.

It is possible to number the lines of a program by ones (1,2,3,etc.). Usually in programming the lines are numbered by tens (10,20,30,etc.). This allows the programmer to add lines between lines if necessary. ATARI PILOT has two very useful commands for numbering programs.

The AUTO command allows the typing of programs without the programmer having to type in line numbers. This command defaults (does without other instruction) to a starting number of 10, counting lines by tens (10,20,30,etc.). If any part of a program already loaded in the computer has the number 10 or any of the new numbers AUTO will assign, the instruction will be changed to the line AUTO types. In order to use AUTO without losing existing lines it is possible to tell AUTO to assign a beginning number to create a sequence which will not overwrite any previous numbers, e.g. AUTO 100 will start numbering at 100 counting by tens. This will not overwrite any line numbers below 100. You can also tell AUTO how to number the instructions, e.g. AUTO 100,1 tells AUTO to begin at 100 and to number the lines by ones.

The REN command allows renumbering of programs loaded into the computer. The command is similar to AUTO, e.g. REN 100 renumbers the lines of the program so the first line is numbered 100; REN 100,1 will number the lines beginning with 100 counting by ones (100,101,102,etc.). The REN command also allows the easy addition of lines in a program by creating 9 empty line numbers between existing lines which are number by tens unless otherwise specified.

The cursor movements on the ATARI computer allow for easy changing or removal of lines. To remove a line one simply types the number of the line to be deleted. To change the instructions on a line it is possible to position the cursor over the first character afer the line number and type in new instructions. If a similar line with a different number is wanted, one can position the cursor over the line number and type the new line number to make a duplicate line. (If the original line is not wanted, be sure to type the original line number or the line will remain in the program.)

The T:, A:, and E: commands

T: is usually the first command used in PILOT. It tells the computer to type something. In the immediate mode T: return will type the characters after the T: on the line below. In a program T: is usually used to type instructions or words where they are wanted. T: with nothing following it tells the computer to type a blank line.

The A: command tells the computer to accept input from the keyboard. There are several different uses of the A: command, but to begin just use it to accept anything typed in from the keyboard. Input is ended by typing return. My children like to type in this short program to experiment with the A: command:

```
10 R: My Memo Pad [The R: command is the remark command
which tells the computer to ignore the characters which follow and to
proceed to the next line. Remarks are used to make programs readable
and understandable to people.]
10 A:
20 E:
```

When run is typed the program allows anything to be typed on to the screen.

The E: command ends a program or a module of a program (modules will be discussed next month). All programming should end with the E:; it saves much future frustration when one begins to write longer programs if the habit has been developed. The E: at the end of a program returns the computer to the immediate mode.

The T:, A:, and E: commands can be used by themselves for simple riddle and instruction type programs. I have not included any such examples due to space because they are numerous in the PILOT manual.

The PILOT Designmaker

This program allows a child to choose one of 4 shapes, to position the shape on the screen, then to draw the shape in the desired color. It is appropriate for older young children, although my just turned three year old was able to use it after some instruction.

Please note each module in the tanagram type program which follows ends with an E: command to prevent the computer from proceeding to the module or line with the next highest line number.

Jim Carr of Corvallis sent me the excellent joy stick sensing routine used in the *JOY module. I am much indebted to him for it; without it the program is many lines longer.

The program is fairly straight forward, but I will discuss modules next month; so keep it handy if you are interested. It is through the use of modules (and Jim's superb routine) that the program has been kept to a minimum length.

MATH WARS

MATH WARS is modelled around a popular game. Unlike that game, this one is in ATARI BASIC. This article illustrates how BASIC can make a fast action game which is easy to write into your ATARI.

A lot of people object to computers being used as flash cards. Flash cards have their place in learning arithmetic, but they can become "old" very soon. One way to get around the problem is to make the flash cards into a game.

A flash card type game at its best has the following elements:

1) easily learned ground rules;
2) eye-catching graphics;
3) meaningful sound effects;
4) age-range adaptability;
5) a pleasant, positive reward.

When all these items are combined, such as in MATH WARS, learning can be fun, and therefore the child will want to learn more.

MATH WARS is designed for children as young as first grade level (possibly even younger). This program is in Graphics Mode 2, which has a very simple screen. The only instructions are to type in the correct answer and press RETURN. If the answer is wrong nothing happens. A correct answer causes an explosion routine to run and the problem blows up. If the correct answer is not typed into the computer in time, the problem explodes at the bottom. Then the correct answer is shown at the center of the screen.

There are two things I feel are good to point out in this program. The first is the animation, accomplished using a FOR/NEXT. The FORs are in Lines 240 and 420 and use only one NEXT in Line 410. Second, by the use of Lines 270 or 280, the word "ANSWER" and the number typed in are shown at the bottom of the screen without an ERROR 141 (cursor out of range) being generated.

One last note: If you modify several lines (190, 250, 340, 350 and 360) the program could be made to work easily with subtraction or multiplication.

—Andrew A. Acks
Boise User Group

A BANDITS REVIEW

by David Ellsworth

Bandits is an interesting Space Invaders type game by Sirius. The main difference is that instead of the ship progressing down, it sends more and different missiles. The attackers range from Phalanx at 75 points which are easy to hit to Torrents which are red areas on the bottom of the screen at 150 points. Since the Torrents are at the bottom of the screen where a player maneuvers, they are very dangerous. I call them radio-active spots.

I like the game very much. If you like Space Invaders, you'll like Bandits.

RUTH ELLSWORTH

A new PILOT Program
by Ruth Ellsworth

```
10 R:PILOT DESIGNMAKER
20 R:Ruth Ellsworth
30 R:MAY 1983    Eugene, Oregon
40 GR:CLEAR
50 C:#P=1
60 *START
70 U:*PIX
80 *MAIN
90 J:*SELPIX
100 E:
110 *PIX
120 GR:PENYELLOW
130 GR:GOTO40,47;DRAWTO40,-31
140 GR:GOTO54,34;4(DRAW10;TURN90)
150 GR:GOTO40,27;DRAWTO79,27
160 GR:GOTO59,11;TURNTO-90;20(DRA
W2;TURN18)
170 GR:GOTO40,8;DRAWTO79,8
180 GR:GOTO54,-7
190 GR:TURNTO45;DRAW14;TURN90;DRA
W14;TURN135;DRAW19
200 GR:GOTO40,-11;DRAWTO79,-11
210 GR:GOTO53,-26
220 GR:TURNTO0;2(DRAW10;TURN90;DR
AW20;TURN90)
230 E:
240 *SELPIX
250 C:#S=0
260 T:
270 T:
280 T:USE JOYSTICK TO SELECT SHAP
E
290 J:*SHAPE
300 E:
310 *SHAPE
320 J(%J0=1):*SQUARE
330 J(%J0=8):*CIRCLE
340 J(%J0=2):*TRIANGLE
350 J(%J0=4):*RECTANGLE
360 J:*SHAPE
370 E:
380 *SQUARE
390 C:#S=1
400 GR:PENRED
410 GR:GOTO54,34;TURNTO0;4(DRAW10
;TURN90)
420 J(%T8=1):*INST
430 GR:PENYELLOW;TURNTO0;GOTO54,3
4;4(DRAW10;TURN90)
440 J:*SHAPE
450 E:
460 *CIRCLE
470 C:#S=2
480 GR:PENRED
490 GR:GOTO59,11;TURNTO-90;20(DRA
W2;TURN18)
500 J(%T8=1):*INST
510 GR:PENYELLOW;GOTO59,11;TURNTO
-90;20(DRAW2;TURN18)
520 J:*SHAPE
530 E:
540 *TRIANGLE
550 C:#S=3
560 GR:PENRED
570 GR:GOTO54,-7;TURNTO45;DRAW14;
TURN90;DRAW14;TURN135;DRAW19
580 J(%T8=1):*INST
590 GR:PENYELLOW;GOTO54,-7;TURNTO
45;DRAW14;TURN90;DRAW14;TURN135;D
RAW19
600 J:*SHAPE
610 E:
620 *RECTANGLE
630 C:#S=4
640 GR:PENRED
650 GR:GOTO53,-26;TURNTO0;2(DRAW1
0;TURN90;DRAW20;TURN90)
660 J(%T8=1):*INST
670 GR:PENYELLOW;GOTO53,-26;TURNT
O0;2(DRAW10;TURN90;DRAW20;TURN90)
680 J:*SHAPE
690 E:
700 *INST
710 T: RELEASE JOYSTICK.  WHEN DO
T APPEARS POSITION SHAPE.  PRESS
TRIGGER TODRAW.
720 PA:100
730 J:*JOY
740 E:
750 *HELP
760 C:@B764=49
770 T:
780 T:SELECT COLOR.  RED=1 YELLOW
=2   BLUE=3
790 *COLOR
800 J(@B764=31):*RED
810 J(@B764=30):*YELLOW
820 J(@B764=26):*BLUE
830 J:*COLOR
840 E:
850 *RED
860 GR:PENRED
870 J:*DRAW
880 E:
890 PA:100
900 *YELLOW
910 GR:PENYELLOW
920 J:*DRAW
930 E:
940 *BLUE
950 GR:PENBLUE
960 J:*DRAW
970 E:
980 E:
990 *JOY
1000 T:
1010 C:#J=%J0
1020 C(#Y(47):#Y=#Y +((#J\2)*#P)
1030 C(#Y)-31):#Y=#Y -((#J/2\2)*#
P)
1040 C(#X)-79):#X=#X -((#J/4\2)*#
P)
1050 C(#X(49):#X=#X +((#J/8\2)*#P
)
1060 J(%T8=0):*PLOT
1070 J(%T8=1):*HELP
1080 J:*JOY
1090 E:
1100 *PLOT
1110 GR:PEN YELLOW; GOTO#X,#Y
1120 J:*ERASE
1130 E:
1140 *ERASE
1150 GR:PEN ERASE;GOTO#X,#Y
1160 J:*JOY
1170 E:
1180 *DRAW
1190 J(#S=1):*SQU
1200 J(#S=2):*CIR
1210 J(#S=3):*TRI
1220 J(#S=4):*REC
1230 E:
1240 *SQU
1250 GR:4(DRAW10;TURN90)
1260 GR:GOTO54,34;PENYELLOW;TURNT
O0;4(DRAW10;TURN90)
1270 J:*SELPIX
1280 E:
1290 *CIR
1300 GR:TURNTO-90;20(DRAW2;TURN18
)
1310 GR:GOTO59,11;PENYELLOW;TURNT
O-90;20(DRAW2;TURN18)
1320 J:*SELPIX
1330 E:
1340 *TRI
1350 GR:DRAW14;TURN90;DRAW14;TURN
135;DRAW19
1360 GR:GOTO54,-7;PENYELLOW;TURNT
O45;DRAW14;TURN90;DRAW14;TURN135;
DRAW19
1370 J:*SELPIX
1380 E:
1390 *REC
```

GOTO Page 13

SHANE ROLIN & ERIC COHEN

—a great game, but has a few bugs send in your corrections

```
0 REM ********************
1 REM * ACE NEWSLETTER  *
2 REM * 3662 VINE MAPLE *
3 REM * EUGENE, OR 97405*
4 REM *      $19 YR     *
5 REM ********************
6 REM --EGGSNATCH--
7 REM --BASE PROGRAM BY ERIC J. C
OHEN, MODIFIED BY SHANE ROLIN
8 REM --16 K VERSION (C) CSOFTWAR
E
9 REM --PROGRAM REQUIRES 10320 BY
TES
10 READ D,E,F,G,H,I,J,L,L,M,N
12 DATA 0,1,2,4,7,256,512,2000,25
00,5000,54286
14 DIM F$(50),G$(50),H$(145),A$(3
),DF$(35)
16 GOSUB 103
17 GOSUB 8700
18 GRAPHICS 7+16
20 POKE 752,1
22 O=PEEK(82):POKE 82,0
24 P=PEEK(560)+PEEK(561)*256+5
26 SETCOLOR 2,0,0
28 FOR Q=1 TO 18:POKE P+Q,15:NEXT
 Q
30 POKE P+20,3
32 POKE P+22,3
34 POKE P+25,6
36 POKE P+27,2
38 POKE P+28,6
40 POKE P+29,2
42 POKE P+30,2
44 POKE P+31,2:POKE P+32,2
46 FOR TQ=33 TO 40:POKE P+TQ,2:NE
XT TQ
48 POKE P+41,2
50 R=8:S=1-64
52 POSITION 0,0
54 COLOR 3
56 FOR T=E TO 1
57 RESTORE 1800
58 READ F$,G$,U,V:W=LEN(F$)
60 FOR X=E TO W:PLOT R+ASC(F$(X))
,S+ASC(G$(X)):NEXT X
62 R=R+U:FOR X=D TO V:NEXT X:NEXT
 T
64 Y=USR(Z,Z,20)
66 POSITION 12,0:? "S O F T W A R
 E"
68 Y=USR(Z,Z,22):POSITION 15,0:?
"PRESENTS..."
70 Y=USR(Z,Z,25):POSITION 6,0:? #
6;"E  G  G  "
72 Y=USR(Z,Z,28):POSITION 0,0:? #
6;" s  n  a  t  c  h "
74 Y=USR(Z,Z,30):POSITION 19,0:?
"by"
76 Y=USR(Z,Z,32):POSITION 14,0:?
"Shane Rolin"
77 Y=USR(Z,Z,33):POSITION 18,0:?
"and":Y=USR(Z,Z,34):POSITION 13,0
:? "Eric J. Cohen"
78 Y=USR(Z,Z,36):POSITION 8,0:? "
FOR EUGENE ATARI USERS":Y=USR(Z,Z
,41):POSITION 7,0:? "COPYRIGHT 19
83 C Software"
80 FOR T=1 TO 1000
82 POKE 53279,19
84 POKE 53279,20
86 NEXT T
88 GOTO 200
90 Q=INT(AA/I):POKE W,AA-Q*I:POKE
 W+E,Q:W=W+F+E:RETURN
92 FOR X=E TO LEN(F$):POKE AB+Y+X
-E,ASC(F$(X)):FOR T=D TO 20:NEXT
T:NEXT X:RETURN
103 FOR H5TR=1 TO 145
104 READ A
105 H$(H5TR,H5TR)=CHR$(A)
106 NEXT H5TR:Z=ADR(H$):RETURN
107 DATA 104,104,133,209,104,24,1
05,115
108 DATA 133,208,169,0,101,209,13
3
109 DATA 209,104,104,133,203,169,
0
110 DATA 133,204,173,48,2,133,206
111 DATA 173,49,2,133,207,160,255
112 DATA 200,177,206,41,15,240
113 DATA 249,177,206,200,133,205,
41
114 DATA 15,240,44,201,1,240,60,3
6
115 DATA 205,80,12,72,177,206,133
116 DATA 212,200,177,206,133,213,
200
117 DATA 104,166,204,228,203,240,
22
118 DATA 132,205,168,177,208,24,1
01
119 DATA 212,133,212,169,0,101,21
3,133
120 DATA 213,164,205,230,204,208,
199
121 DATA 24,105,14,168,177,208,13
3
122 DATA 87,165,212,133,88,165,21
3
123 DATA 133,89,96,40,40,40,40,20
,20
124 DATA 10,10,20,20,20,40,40,40,
0
125 DATA 0,0,0,1,2,3,4,5,6,6,7,7,
8
200 POKE 82,0:POKE 83,40
210 SOUND 0,254,10,10:SOUND 1,255
,10,12:SOUND 2,250,10,10
220 GRAPHICS 0:SETCOLOR 2,0,0
230 ? CHR$(125);"
240 ? "
250 ? "
260 ? :? "YOUR OBJECT IS TO RID T
HE ANT NEST OF"
270 ? "ALL EGGS BEFORE THEY HATCH
 "
280 ? "BUT DON'T HIT A BLACK ANT.
.OR ITS OVER":POKE 82,5
290 ? "FOR YOU!!!":?
300 ? "SCORE ADVANCE TABLE:":?
310 ? "GETTING AN EGG------20---p
ts."
320 ? "ENDING A LEVEL-----1500--p
ts."
330 ? "HITTING AN ANT---LOOSE 1 L
IFE":?
340 ? "PRESS TRIGGER TO PLAY.":?
"PUSH JOYSTICK FOR GAME OPTIONS."
:? :? "      (C)1983 C SOFTWARE"
350 POSITION 0,19:? "
360 POSITION 0,20:? "! (tm)(c) 19
83 by E. COHEN & S. ROLIN  !"
370 POSITION 0,21:? "
370 POSITION 0,21:? "
380 POKE 82,0
390 POSITION 0,1
400 FOR A=1 TO 490:? ;CHR$(30);:I
F STRIG(0)=0 THEN 610
410 IF STICK(0)<>15 THEN 520
420 NEXT A
430 POSITION 0,20:? "
                    "
440 POSITION 0,20:? "! SCORE:";B
450 POSITION 14,20:? "HI-SCORE:";
B
```

STAN OCKERS

```
1490 POSITION 0,5:? #6;"LEVEL= ";
D
1500 POSITION 0,6:? #6;"SCORE= ";
:? #6;B
1510 IF B>=J THEN I=I+1:J=J+10000
1520 IF B>99999 THEN J=10000:B=B-
100000
1530 POSITION 0,7:? #6;"ants left
:"
1540 POSITION 1,8:FOR M=1 TO I:?
#6;CHR$(90);" ";:NEXT M
1550 SOUND 0,130,12,12:SOUND 1,13
1,12,14:FOR Y=1 TO 999:NEXT Y
1560 SOUND 0,0,0,0:SOUND 1,0,0,0:
SOUND 2,0,0,0:SOUND 3,0,0,0
1570 POKE 764,255
1580 RETURN
1590 RESTORE 1660
1600 K=INT((INT((PEEK(144)+256*PE
EK(145))/256)+9)/4)*4
1610 U=USR(CX,57344,K*256,2)
1620 RESTORE 1820:FOR V=1 TO 3
1630 READ U:U=K*256+U*8:FOR W=0 T
O 7:READ X:POKE U+W,X:NEXT W
1640 NEXT V
1650 RETURN
1690 POSITION 0,0:? #6;"HIT esc T
O RESTART":POKE 77,128
1700 POSITION 0,1:? #6;"HIT retur
n tO RESUME"
1710 POKE 764,255
1720 POKE 77,128:IF PEEK(764)=255
 THEN 1720
1730 IF PEEK(764)=28 THEN 200
1740 IF PEEK(764)=12 THEN POKE 76
4,255:GOTO 1760
1750 GOTO 1720
1760 POSITION 0,0:? #6;"
                "
1770 POSITION 0,1:? #6;"
          "
1780 POKE 77,0:RETURN
1790 DATA 0,1,2,4,7,256,512,2000,
2500,5000,54286
1800 DATA LKJIHGFEDCCBBAAABCDEFGH
IJKLNNOO
1810 DATA CBBBCCDEFGHIJKLMNOOOONN
NNMMNOON,22,200
1820 DATA 58,60,255,126,255,219,2
55,66,60
1830 DATA 60,0,60,118,251,251,118
,60,0
1840 DATA 59,0,0,32,222,127,222,2
1,37
8700 RESTORE 8800:FOR X=1 TO 35
8710 READ A
8712 DF$(X,X)=CHR$(A)
8720 NEXT X:CX=ADR(DF$):RETURN
8800 DATA 104,104,133,205,104
8810 DATA 133,204,104,133,207
8820 DATA 104,133,206,104,104
8830 DATA 170,240,16,160,0
8840 DATA 177,204,145,206,136
8850 DATA 208,249,230,205,230
8860 DATA 207,202,208,242,96
```

```
0 REM **********************
1 REM ** ACE NEWSLETTER  **
2 REM ** 3662 VINE MAPLE **
3 REM ** EUGENE. OR 97405**
4 REM **     $10 YR       **
5 REM **********************
10 REM ****************************
20 REM *          SOUNDS          *
30 REM * A Basic program used to*
40 REM * help generate sounds to*
50 REM * be put in strings.      *
60 REM *  STAN OCKERS 6/83       *
70 REM ****************************
80 REM
100 GOSUB 5000:GOSUB 3000:SOUND 0
,0,0,0
110 DIM A$(3),P$(40),D$(40),L$(40
),Z$(40),N$(40),V$(4)
120 Z$(1)=CHR$(0):Z$(40)=CHR$(0):
Z$(2)=Z$:RESTORE 130:FOR I=1 TO 4
:READ A:V$(I,I)=CHR$(A):NEXT I:VN
=1:P=1
130 DATA 2,7,12,17
280 P$=Z$:D$=Z$:L$=Z$
290 GRAPHICS 0:POKE 703,4:POKE 75
2,1:POSITION 2,0:? #6;" ":POSITIO
N 3,4:? #6;"PITCH":POSITION 3,9:?
 #6;"DURATION"
292 POSITION 3,14:? #6;"LOUDNESS"
:POSITION 3,19:? #6;"DISTORTION"
300 V=ASC(V$(VN)):POSITION P,V+1:
? #6;" ";:S=STICK(0):IF STRIG(0)=
0 THEN 350
309 REM * Vertical position of cu
rsor *
310 IF (S=6 OR S=10 OR S=14) AND
VN>1 THEN VN=VN-1
320 IF (S=5 OR S=9 OR S=13) AND V
N<4 THEN VN=VN+1
330 IF (S=5 OR S=6 OR S=7) AND P<
38 AND VN<4 THEN P=P+1
340 IF (S=9 OR S=10 OR S=11) AND
P>1 AND VN<4 THEN P=P-1
342 IF VN=4 THEN P=1
350 V=ASC(V$(VN)):POSITION P,V+1:
? #6;"*";
359 REM * Get data to change *
360 IF VN=1 THEN A=ASC(P$(P)):MAX
=254
370 IF VN=2 THEN A=ASC(D$(P)):MAX
=127
380 IF VN=3 THEN A=ASC(L$(P)):MAX
=15
390 IF VN=4 THEN A=DIST:MAX=14
400 IF STRIG(0)=1 THEN 428
409 REM * Update data with joysti
ck *
410 IF S=14 AND A<MAX THEN A=A+1:
IF VN=4 THEN A=A+1
412 IF S=7 AND A+10<MAX THEN A=A+
10
420 IF S=13 AND A>0 THEN A=A-1:IF
 VN=4 THEN A=A-1
422 IF S=11 AND A>10 THEN A=A-10
428 IF PEEK(764)<255 THEN GOSUB 4
000:GOTO 490
429 REM * Update string *
430 IF VN=1 THEN P$(P,P)=CHR$(A)
440 IF VN=2 THEN D$(P,P)=CHR$(A)
450 IF VN=3 THEN L$(P,P)=CHR$(A)
460 IF VN=4 THEN DIST=A
470 GOSUB 6000
490 POKE 764,255:GOTO 300
2999 REM * Set up interrupt routi
ne *
3000 A=ADR(CTSND$):HI=INT(A/256):
LO=A-256*HI:POKE 552,LO:POKE 553,
HI
3010 DIM S$(120):A=ADR(S$):HI=INT
(A/256):LO=A-256*HI:POKE 1789,LO:
POKE 1790,HI
3020 RETURN
3999 REM * Print data - Make soun
d *
4000 SAV=P:P=0:PS=0:? CHR$(125)
4010 P=P+1:PS=PS+1
4020 PIT=ASC(P$(P)):DUR=ASC(D$(P)
):LOUD=ASC(L$(P)):IF DUR=0 THEN 4
100
4030 S$(PS,PS)=CHR$(DUR):PS=PS+1:
? DUR;",";
4040 S$(PS,PS)=CHR$(PIT):? PIT;",
";:PS=PS+1
4050 S$(PS,PS)=CHR$(LOUD):? LOUD;
",";:GOTO 4010
4100 S$(PS,PS)=CHR$(0):S$(PS+1,PS
+1)=CHR$(0):? "0,0"
4105 POKE 1788,DIST*16:POKE 538,1
4110 P=SAV:RETURN
4999 REM * Create interrupt routi
ne *
5000 RESTORE 5010:DIM CTSND$(58):
FOR J=1 TO 58:READ A:CTSND$(J,J)=
CHR$(A):NEXT J:RETURN
5010 DATA 173,253,6,133,203,173,2
54,6,133,204,172,255,6,177,203,24
0,28
5012 DATA 141,26,2,238,255,6,200,
177,203,141,0,210,238,255,6,200,1
77,203,13,252,6
5013 DATA 141,1,210,238,255,6,96
5014 DATA 141,255,6,141,1,210,200
,177,203,141,26,2,96
5999 REM * Print a vertical # *
6000 A$=STR$(A):L=LEN(A$):FOR I=0
 TO 2:IF I<L THEN POSITION P,V-I:
? #6;A$(L-I,L-I);
6010 IF I>=L THEN POSITION P,V-I:
? #6;" ";
6020 NEXT I:RETURN
```

```
                10 ; Interrupt Routine for
                20 ; Sound using System
                30 ; Timer #2
                40 ;   S.O.  6/83
D200            50 AUDF1    =   $D200
D201            60 AUDC1    =   $D201
021A            70 CDTMV2   =   $021A     ; (538)
00CB            80 OFFLO    =   $CB
0000            90          *=  $06FC
06FC            0100 DIST   *=  *+1       ; (1788)
06FD            0110 STRLO  *=  *+2       ; (1789)
06FF            0120 STRPOS *=  *+1       ; (1791)
0700            0130        *=  0
0000 ADFD06 0140        LDA  STRLO    ; Point at sound string ...
0003 85CB   0150        STA  OFFLO    ; Using indirect pointer
0005 ADFE06 0160        LDA  STRLO+1
0008 85CC   0170        STA  OFFLO+1
000A ACFF06 0180        LDY  STRPOS   ; Offset into string
000D B1CB   0190        LDA  (OFFLO),Y ; First byte should be duration
000F F01C   0200        BEQ  FIN      ; Zero duration means finished
0011 8D1A02 0210        STA  CDTMV2   ; Else reset timer
0014 EEFF06 0220        INC  STRPOS   ; Next byte
0017 C8     0230        INY
0018 B1CB   0240        LDA  (OFFLO),Y ; Should be pitch
001A 8D00D2 0250        STA  AUDF1    ; Update register
001D EEFF06 0260        INC  STRPOS   ; Next byte
0020 C8     0270        INY
0021 B1CB   0280        LDA  (OFFLO),Y ; is volume
0023 0DFC06 0290        ORA  DIST     ; Mix with distortion
0026 8D01D2 0300        STA  AUDC1    ; for control
0029 EEFF06 0310        INC  STRPOS   ; Index for next byte
002C 60     0320        RTS           ; Back to Basic
002D 8DFF06 0330 FIN    STA  STRPOS   ; Reset pointer
0030 8D01D2 0340        STA  AUDC1    ; Cut off sound
0033 C8     0350        INY           ; Next byte
0034 B1CB   0360        LDA  (OFFLO),Y ; we will repeat if
0036 8D1A02 0370        STA  CDTMV2   ; not zero
0039 60     0380 OVER   RTS           ; Back to Basic
```

—an extension to the scrolling Demo from the last issue

```
0 REM **********************
1 REM ** ACE NEWSLETTER  **
2 REM ** 3662 VINE MAPLE **
3 REM ** EUGENE. OR 97405**
4 REM **     $10 YR      **
5 REM **********************
6 REM *ADDITION TO CITY SCROLL*
7 REM *   STAN OCKERS 6/83    *
8 REM ************************
9 REM line 10 must be 1st DIM ent
ered after power up.
10 DIM PM1$(128),PM2$(128),PM3$(1
28)
30 DIM HFL$(14),HRL$(14),PRL$(14)
,HFR$(14),HRR$(14),PRR$(14),CRASH
$(20)
40 DIM CLEAR$(128):CLEAR$(1)=CHR$
(0):CLEAR$(128)=CHR$(0):CLEAR$(2)
=CLEAR$:? CHR$(125):? "INITIALIZI
NG (45 SEC)"
50 RESTORE 60:FOR J=1 TO 14:READ
A:HFL$(J,J)=CHR$(A):NEXT J
60 DATA 0,0,1,3,1,15,19,35,35,63,
17,127,0,0
70 RESTORE 80:FOR J=1 TO 14:READ
A:HFR$(J,J)=CHR$(A):NEXT J
80 DATA 0,0,128,192,128,240,200,1
96,196,252,136,254,0,0
90 RESTORE 100:FOR J=1 TO 14:READ
 A:HRR$(J,J)=CHR$(A):NEXT J
100 DATA 0,0,0,1,0,65,175,71,3,1,
0,3,0,0
120 RESTORE 130:FOR J=1 TO 14:REA
D A:HRL$(J,J)=CHR$(A):NEXT J
130 DATA 0,0,0,128,0,130,245,226,
192,128,0,192,0,0
140 RESTORE 150:FOR J=1 TO 20:REA
D A:CRASH$(J,J)=CHR$(A):NEXT J
150 DATA 120,20,43,128,83,221,44,
233,90,29,159,73,22,199,88,77,66,
55,8,3
170 RESTORE 180:FOR J=1 TO 7:READ
 A:PRL$(J,J)=CHR$(A):NEXT J
180 DATA 0,0,0,255,0,0,0
196 REM PM INIT.
197 REM see June '83 COMPUTE! P.
187
198 REM article by Staffan Sandbe
rg
200 A=PEEK(106)-4
210 POKE 54279,A
220 VSA=256*PEEK(135)+PEEK(134)
230 BOA=256*PEEK(141)+PEEK(140)
240 PM=256*A+512
250 DISP=PM-BOA
260 ADD=2
270 FOR T=1 TO 3
280 PMHIGH=INT(DISP/256)
290 PMLOW=DISP-256*PMHIGH
300 POKE VSA+ADD,PMLOW
310 POKE VSA+ADD+1,PMHIGH
320 DISP=DISP+128:ADD=ADD+8
330 NEXT T
342 REM colors
345 GRAPHICS 7:RESTORE 346:FOR J=
708 TO 712:READ A:POKE J,A:NEXT J
346 DATA 32,14,86,84,8
347 GOSUB 1010:GOSUB 2000:GOSUB 2
200:GOSUB 2300:GOSUB 2100:POKE 75
6,CSPAGE:GOSUB 5000:GOSUB 3000
348 A=USR(1580)
350 POKE 559,46:POKE 53277,3
360 COLR1=0:COLR2=0:COLR3=74
370 POKE 704,COLR1:POKE 705,COLR2
:POKE 706,COLR3
380 X1=125:X2=133:X3=129:POKE 532
58,1
390 POKE 53248,X1:POKE 53249,X2:P
OKE 53250,X3
400 Y1=75:Y2=75:Y3=75:DIR=1:POKE
1665,0
410 PM1$=CLEAR$:PM2$=CLEAR$:PM3$=
CLEAR$
419 REM Main loop starts here
420 IF STICK(0)<8 AND HOR<20 THEN
 HOR=HOR+1
430 IF STICK(0)>8 AND STICK(0)<13
 AND HOR>-20 THEN HOR=HOR-1
432 X1=X1+0.1*HOR
434 DIR=255:IF HOR<0 THEN DIR=1
436 IF X1<50 THEN X1=50:POKE 1665
,1:GOTO 440
438 IF X1>190 THEN X1=190:POKE 16
65,255:GOTO 440
439 POKE 1665,0
440 IF STICK(0)=14 AND ROT<20 THE
N ROT=ROT+1
450 IF STICK(0)=13 AND ROT>-20 TH
EN ROT=ROT-1
452 Y1=Y1-0.1*ROT
454 IF Y1<20 THEN Y1=20
456 IF Y1>100 THEN Y1=100
460 PM3$=CLEAR$:POKE 53278,0
462 IF DIR=1 THEN PM1$(Y1)=HFL$:P
M2$(Y1)=HRL$
464 IF DIR=255 THEN PM1$(Y1)=HRR$
:PM2$(Y1)=HFR$
470 IF RND(0)>0.5 THEN PM3$(Y1)=P
RL$
475 POKE 1664,X1
480 P=PEEK(53252):IF P=0 THEN 420
```

```
490 IF P=8 THEN ROT=0:GOTO 440
500 POKE 538,0:POKE 1789,ELO:POKE
 1790,EHI:POKE 1791,0:POKE 538,1
505 POKE 1665,0:FOR J=1 TO 10:R=I
NT(RND(0)*10):PM1$(Y1)=CRASH$(1+R
,11+R):PM2$(Y1)=CRASH$(11-R,20-R)
507 FOR K=1 TO 20:NEXT K:NEXT J
510 IF STRIG(0)=1 THEN 510
512 POKE 1789,PLO:POKE 1790,PHI:P
OKE 538,1
520 Y1=25:X1=100:ROT=0:HOR=0:GOTO
 410
1000 REM * change character set *
1010 DIM MCS$(42):RESTORE 1020:FO
R J=1 TO 42:READ A:MCS$(J,J)=CHR$
(A):NEXT J
1020 DATA 104,169,0,133,203,133,2
05,169,224,133,204,165,106,56,233
,21,133,106,24
1030 DATA 105,1,133,206,162,4,160
,0,177,203,145,205,200,208,249,23
0,204,230,206,202,208,242,96
1040 A=USR(ADR(MCS$)):CSPAGE=PEEK
(106)+1:CS=256*CSPAGE:SCRST=CS+10
24
1050 RESTORE 1060:FOR J=CS+776 TO
 CS+968:READ A:POKE J,A:NEXT J:RE
TURN
1060 DATA 255,219,219,219,219,219
,219,255,150,150,150,170,150,150,
150,150,85,125,125,125,125,125,12
5,85
1070 DATA 85,105,105,105,105,105,
105,85,255,215,215,125,125,215,21
5,255,170,251,170,191,170,251,170
,191
1080 DATA 169,165,101,101,170,105
,89,90,0,0,0,0,0,0,255,255,235,23
5,255,235,235,255,235,235
1090 DATA 85,101,101,101,101,101,
101,85,255,215,255,215,255,215,25
5,215,219,182,109,219,182,109,219
,118
1999 REM * Create New Display Lis
t *
2000 FOR J=1539 TO 1572 STEP 3:PO
KE J,85:NEXT J
2002 DIM BHI(12),BLO(12)
2003 FOR J=1 TO 12:B=SCRST+256*J-
46:BHI(J)=INT(B/256):BLO(J)=B-256
*BHI(J):NEXT J
2005 FOR J=1536 TO 1538:POKE J,11
2:NEXT J:K=1540:FOR J=1 TO 12:POK
E K,BLO(J):POKE K+1,BHI(J):K=K+3:
NEXT J
2010 POKE 1575,65:POKE 1576,0:POK
E 1577,6:POKE 560,0:POKE 561,6:RE
TURN
2099 REM * Init. Page 6 Values *
2100 RESTORE 2102:FOR J=1664 TO 1
667:READ A:POKE J,A:NEXT J
2102 DATA 1,1,2,0
2104 REM * VBI Scrolling Routine
*
2105 DIM VBI$(148):RESTORE 2108:F
OR J=1 TO 148:READ A:VBI$(J,J)=CH
R$(A):NEXT J
2107 A=ADR(VBI$):HI=INT(A/256):LO
=A-256*HI:POKE 1582,LO:POKE 1584,
HI:RETURN
2108 DATA 216,173,128,6,141,0,208
,141,2,208,24,105,8,141,1,208,173
,129,6,240,66
2110 DATA 16,9,173,130,6,201,1,14
4,57,176,7,173,130,6,201,216,176,
48
2111 DATA 173,129,6,240,43,16,15,
206,131,6,16,30,169,3,141,131,6,1
41,4,212,208,29,238,131,6,173,131
,6
2112 DATA 201,4,144,10,169,0,141,
131,6,141,4,212,240,9,173,131,6,1
41,4,212,24,144,55
2120 DATA 216,162,0,173,129,6,48,
16,189,4,6,56
2130 DATA 233,1,157,4,6,176,19,22
2,5,6,144,14
2140 DATA 189,4,6,24,105,1,157,4,
6,144,3,254,5,6,232,232,232,224,3
7,144,214
2145 DATA 24,173,130,6,109,129,6,
141,130,6,76,98,228
2199 REM * Insert VBI Routine *
2200 RESTORE 2210:FOR J=1580 TO 1
589:READ A:POKE J,A:NEXT J:RETURN

2210 DATA 104,160,132,162,6,169,7
,76,92,228
2299 REM * Draw Buildings *
2300 RESTORE 2360:B=SCRST
2310 READ WAL,ROW,COL,WID:IF WAL=
0 THEN 2400
2320 FOR J=ROW TO 12:START=B+256*
J+COL
2330 FOR K=1 TO WID:POKE START+K,
WAL:NEXT K
2340 NEXT J:GOTO 2310
2360 DATA 102,1,0,2,103,11,2,6,97
,5,8,8,98,8,14,6,102,11,20,6,105,
3,30,8,100,5,26,6,101,8,34,4,99,6
,52,8
2370 DATA 107,4,60,6,108,7,64,6,9
7,3,82,8,103,10,68,18,106,7,90,4,
107,5,94,6,100,8,106,8,105,10,96,
12
2380 DATA 98,6,114,6,102,12,120,6
,106,4,126,8,101,8,134,4,230,11,1
48,64,99,8,150,12,233,9,164,6,97,
4,170,6
2390 DATA 100,9,178,8,99,9,194,6,
98,10,188,8,107,10,202,8,105,7,21
2,16,97,10,226,8,106,8,240,14,0,0
,0,0
2400 RESTORE 2460
2410 READ ROW,COL,WID:IF ROW=0 TH
EN 2500
2420 START=SCRST+256*ROW+COL+1:FO
R J=START TO START+WID-1:POKE J,2
32:NEXT J
2430 GOTO 2410
2460 DATA 10,2,6,10,20,6,10,38,6,
9,76,6,76,9,6,4,94,6,11,120,6,10,
138,6,8,164,6,8,194,6,11,234,6,0,
0,0
2500 RESTORE 2560
2510 READ ROW,COL,WID:IF ROW=0 TH
EN RETURN
2520 START=SCRST+256*ROW+COL+1:FO
R J=START TO START+WID-1:POKE J,1
01:NEXT J
2530 GOTO 2510
2560 DATA 8,38,8,11,38,16,6,76,6,
8,138,6,11,138,10,0,0,0
2999 REM * Sound Strings *
3000 DIM PROP$(11):RESTORE 3010:F
OR J=1 TO 11:READ A:PROP$(J,J)=CH
R$(A):NEXT J
3010 DATA 2,3,8,3,2,6,4,1,3,0,1
3012 DIM EXPL$(14):RESTORE 3014:F
OR J=1 TO 14:READ A:EXPL$(J,J)=CH
R$(A):NEXT J
3014 DATA 20,30,14,10,20,8,30,40,
10,40,60,5,0,0
3016 A=ADR(EXPL$):EHI=INT(A/256):
ELO=A-256*EHI
3020 A=ADR(CTSND$):HI=INT(A/256):
LO=A-256*HI:POKE 552,LO:POKE 553,
HI
3030 A=ADR(PROP$):PHI=INT(A/256):
PLO=A-256*PHI:POKE 1789,PLO:POKE
1790,PHI:POKE 1788,8:POKE 538,1:R
ETURN
4999 REM * Create interrupt routi
ne *
5000 RESTORE 5010:DIM CTSND$(58):
FOR J=1 TO 58:READ A:CTSND$(J,J)=
CHR$(A):NEXT J:RETURN
```


GOTO 12

WAYNE REAL: EDUCATION PROGRAMS

One of several very good Educational Games by Wayne Real, Australia they all will be on our next Educational Disk or Tape

```
0 REM **********************
1 REM ** ACE NEWSLETTER  **
2 REM ** 3662 VINE MAPLE **
3 REM ** EUGENE. OR 97405**
4 REM **     $10 YR       **
5 REM **********************
6 REM ODD MAN OUT SERIES-PLURALS
7 REM REV.0.1
8 REM 26.1.83
9 REM (COPYRIGHT 1983 Wayne Real)
10 GOSUB 32000:R=0:WR=0:DIM C$(4)
,N(4):GOTO 31000
999 DL=PEEK(560)+256*PEEK(561):RE
TURN
1000 POKE 756,CB:POKE 708,140:POK
E 709,222:POKE 710,92:POKE 711,14
:POKE 712,196
1005 POSITION 6,0:? #6;"plurals
     pick the odd one out"
1010 R=INT(RND(0)*25)+1:RESTORE 3
0000+R*5:READ C,W1$,W2$,W3$,W4$:F
OR W=4 TO 10 STEP 2:POSITION 10,W
:? #6;"          "
1020 NEXT W:POSITION 10,4:? #6;W1
$:POSITION 10,6:? #6;W2$:POSITION
 10,8:? #6;W3$:POSITION 10,10:? #
6;W4$;:POSITION 1,V:? #6;"
  ";
1999 GOSUB 6000
3000 ? #6;"}":POKE 710,202:POSITI
ON 0,0:? #6;"    plural words":?
#6;" THEY CAN HAVE MANY   DIFFERE
NT ENDINGS"
3010 ? #6;"SOME END IN 'S'   "
3011 ? #6;"OTHER'S END IN 'ES'"
3012 ? #6;"   some need you
to make changes "
3013 ? #6;"CHANGE 'Y' TO AN 'I'AN
D THEN ADD 'ES'"
3014 ? #6;"CHANGE 'F' TO A 'V' AN
D THEN ADD 'ES' "
3020 POSITION 1,11:? #6;"press st
art button";:GOTO 31111
4000 POSITION 0,11:? #6;"
          ";
4005 POSITION 1,11:? #6;"GREAT ";
N$;:ZZ=PEEK(712):FOR W=21 TO 7 ST
EP -1:POKE 712,(W-5)*15+12
4010 FOR WW=15 TO 0 STEP -1:SOUND
 0,W,10,WW:NEXT WW:NEXT W
4090 POSITION 0,11:? #6;"
          ";
4999 POSITION H,V:? #6;"  ";:RI=R
I+1:GOTO 1000
5000 FOR W=70 TO 0 STEP -1:SOUND
0,63,8,INT(W/5):NEXT W:POSITION 0
,11:? #6;"                ";:P
OSITION 0,11:? #6;"WRONG ";N$;
5010 FOR W=230 TO 70 STEP -20:SOU
ND 0,W,10,10:POSITION 6,C:? #6;">
>>";:FOR WW=1 TO 35:NEXT WW:SOUN
D 0,0,0,0
5020 POSITION 6,C:? #6;"    ";:FO
R WW=1 TO 21:NEXT WW:NEXT W:SOUND
 0,23,4,15:FOR W=1 TO 77:NEXT W:S
OUND 0,0,0,0
5090 POSITION 0,11:? #6;"
          ";
5999 POSITION H,V:? #6;"  ";:WR=W
R+1:GOTO 1000
6000 POSITION H,V:? #6;"]^":POKE
77,0:IF XX=1 THEN GOSUB 7005
6100 S=STICK(0):IF S=14 AND V>3 T
HEN POSITION H,V:? #6;"  ":V=V-1:
POSITION H,V:? #6;"]^":GOTO 6105
6102 IF S=13 AND V<10 THEN POSITI
ON H,V:? #6;"  ":V=V+1:POSITION H
,V:? #6;"]^":GOTO 6105
6103 GOTO 6110
6105 FOR W=15 TO 0 STEP -1:SOUND
0,49,8,W:NEXT W
6110 IF STRIG(0)=0 AND V/2=INT(V/
2) THEN GOSUB 6200
6150 IF PEEK(764)=62 THEN POKE 76
4,255:GOSUB 7000
6199 FOR W=1 TO 14:NEXT W:GOTO 61
00
6200 FOR W=9 TO 1 STEP -1:POSITIO
N 0,V:? #6;TR$(W,10):GOSUB 6990:N
EXT W:IF V<>C THEN 5000
6210 FOR W=0 TO 9:POSITION W,V:?
#6;" ";TR$;:GOSUB 6990:NEXT W
6220 FOR W=9 TO 1 STEP -1:POSITIO
N 19-W,V:? #6;" ";TR$(1,W):GOSUB
6990:NEXT W:POSITION 19,V:? #6;"
";:GOTO 4000
6990 FOR WW=15 TO 0 STEP -1:SOUND
 0,49,8,WW:NEXT WW:FOR WW=1 TO 14
:NEXT WW:RETURN
7000 IF XX=1 THEN XX=0:POSITION 1
,11:? #6;"                ";:RE
TURN
7005 XX=1:POSITION 14,11:? #6;"
   ";:POSITION 1,11:? #6;RI;"righ
t ";WR;"wrong";:RETURN
30005 DATA 10,CARS,rabbits,bears,
SKIES
30010 DATA 6,branches,HALVES,wish
es,BUSHES
30015 DATA 4,foxes,wives,KNIVES,H
ALVES
30020 DATA 8,PARTIES,fairies,oxen
,BODIES
30025 DATA 10,DUCKS,APPLES,kings,
bodies
30030 DATA 10,MATCHES,brushes,fox
es,FAIRIES
30035 DATA 10,HANDS,letters,books
,BABIES
30040 DATA 10,BOYS,SISTERS,planes
,ladies
30045 DATA 10,stars,rings,LANDS,L
OLLIES
30050 DATA 8,DISHES,wishes,lids,B
ENCHES
30055 DATA 8,NAPPIES,lollies,men,
LORRIES
30060 DATA 8,ELVES,THIEVES,benche
s,wharves
30065 DATA 8,DISHES,GLASSES,parti
es,wishes
30070 DATA 8,SHELVES,calves,kisse
s,leaves
30075 DATA 6,BOXES,sheep,rushes,W
ITCHES
30080 DATA 6,TRIES,GEESE,ponies,f
lies
30085 DATA 6,SKIES,FEET,ladies,sp
ies
30090 DATA 6,calves,wishes,HOOVES
,LOAVES
30095 DATA 6,CURRIES,MICE,monies,
pennies
30100 DATA 6,SCARVES,witches,live
s,SHELVES
30105 DATA 4,GLASSES,TRAINS,lette
rs,friends
30110 DATA 4,elves,goblins,HORSES
,STAMPS
30115 DATA 4,parties,balloons,CAK
ES,TIGERS
30120 DATA 4,THIEVES,BANKS,robber
s,whistles
30125 DATA 4,PONIES,GLUES,shoes,s
ticks
31000 POKE 708,222:POKE 709,142:P
OKE 710,20:POKE 711,92:POKE 712,2
0:DIM W1$(10),W2$(10),W3$(10),W4$
(10)
31010 ? #6;"}":GOSUB 999:POKE DL+
6,7:POKE DL+11,7:POSITION 0,1
```

C E S

Hello from Chicago, home of the Consumer Electronics Show. Among an incredible array of new software, a powerhouse computer from Coleco and inventions straight out of Flash Gordon and Dick Tracy was an all new ATARI. Say goodbye to the 400 & 800, and even the six-month-old 1200. Here's a quick overview of the new products:

ATARI 600XL - 16K, $199.00. Available July.
ATARI 800XL - 64K, $299.00. Available August.
ATARI 1400XL - 64K, $499.00. Speech & Modem built in.
Available September.
ATARI 1450XL - 64K, $749.00. Built in double density drive.
Available October.
ATARI 1027 - Letter Quality Printer. $349.00.
ATARI 1050 - enhanced density drive(127K). $449.00.
ATARI 1030 - Direct Connect Modem. Built in software. $?.??
Available 4th quarter.
Touch Tablet - Graphics Pad w/ software. $79.00.
Available 4th Quarter.
Trak-Ball - $59.00
ATARILAB - Real world interface for experimental uses. $89.95.
CPM Option - Z-80, 64K beige box. $??. Available ??.
Light pen - nice pen w/ software. Still a prototype.$99-149.
Available ??

Now a few details and observations. All the new computers have built in ATARI BASIC and the 14K operating system. The 600XL is expandable to 64K with a plug on module. An exciting feature for hardware people is the accessibility of the processor bus through a port on the rear of the machines. This port supports all data and control lines. The processor is the 6502C. A bug free 6502 with several new operations. This chip is examined in detail in the May MICRO. This necessitates the introduction of ASSEMBLER II to handle the new commands. Some of the bit comparisons and list handling operations are a blessing to graphics users. All computers have one cart slot, two joyports, the ATARI serial port and the previously mentioned processor bus.

The most exciting products are the 1400XL and the 1450XL with built-in speech synthesizer (votrax type) and modem. The modem also contains its own software. The 1450XL also has a built in double-sided, enhanced density drive. This is a very fast drive as it accesses the bus directly instead of through the serial port.

I keep saying "enhanced" density because for some reason they have only managed to get 127K on a single side. Why ATARI cannot equal every other company on the market is puzzling. Even the VIC drives hold 170K. I think the PERCOM or the RANA are still a better bet than the ATARI.

The 1027 Letter-Quality Printer is a very interesting apparatus. It has a speed of 20cps and runs very quietly. Standing next to the printer one can hardly hear it print. The type is Prestige Elite and is of good quality. The print mechanism is unlike any others I have seen; it resembles most nearly a rubber stamp. A package will be available which includes this printer, an ATARI 600XL and the ATARIWRITER cartridge.

I've already mentioned the disk drives, but I forgot to say a new DOS 3.0 will be released this fall to support the enhanced density mode. Although I did not experiment, this DOS resembles superficially OS v.4 from Optimized Systems. Only time will tell if it is as good a product.

The new modem, the 1030, is a direct-connect, auto-dial, auto answer, 300 baud modem with built in software. As to up/down load protocals no one seemed to know. It supposedly is also compatible with Telelinks 1&2.

My favorite introduction at the show was the ATARI Touch Tablet. This is a small graphics pad which can be drawn on with finger or stylus. In size it corresponds to the proportions of the screen and as such makes a nearly ideal input device. It will come with software similar to PAINT (a new ATARI aquisition). Hopefully technical details will be available for those of us who wish to write our own software. The package with tablet and cassette based software will be $79.00. It should be available sometime in the fourth quarter. My only complaint so far is the software seems to only use GR.7 or 7.5 which is all well and good, but why ignore the potential of 9-11? Surely the machines at ATARI R&D have GTIA chips!

The CP/M Option is a 64K Z-80 based computer which will plug in and use the ATARI as a smart terminal. It will allow the ATARI to use CP/M 2.2 software which of course includes hundreds of programs. Including languages, spreadsheets, data-bases, ans word-processors not normally available. The option provides 80 column capability. The module is being produced for ATARI by Add-On Software, inc. Who will also provide a catalog of CP/M software in ATARI format. Without knowing the cost or date of availability of this unit I can't really compare it to others available. At first glance I think the ATR-8000 is probably more flexible in the long run. However the simplicity and support of the ATARI unit will probably make it quite popular.

That's really about it for the hardware. There was so much software introduced I can not cover it here. Suffice it to say you should be seeing some very exciting things in the near future. I was particularly impressed by EPYX's new line and also a new company called Electronic Arts. Atari itself has several exciting games and educational programs available including a dynamite POLE-POSITION. They also have a deal with Disney to produce software based on their characters. ATARI introduced a very useful LOGO on cartridge and a cartridge-based Microsoft basic(which neds an additional disk to fill out the commands to equal the 32Kversion).

To close let me say I was very impressed by ATARI's planning. They seem to have figured out what their market is. With the tremendous support they are getting from third party sources they will have to try to fail. Of course given their past management record anything is possible. Right now I believe the home market really boils down to ATARI, Commodore, and with the new ADAM, Coleco. Coleco is really something! 80K, built in wafer tape drive, built in word-processing, and believe it or not - a letter quality printer all for around $600!! It's getting very interesting out there.

— S.A.Berfield
644 W.Surf, Chicago, IL 60657

QUICKIE IN CHICAGO

by Kirt E. Stockwell

Sunday is my one and only day off each week. So I listened with mixed emotions to Mark Cater of ATARI user group support offering me a trip to Chicago. But I had visions of CES in my head, hoping to spend some time ogling the latest in electronic wizardry.

Sunday at 5:00 am I dragged myself out of bed to fly to Chicago as one of Ten user group presidents flown to Chicago by Atari.

Mark rounded us all up in the Hotel lobby at about 5:00 pm to go to an auditorium in a nearby bank building built in the shape of the ATARI logo. Taller, but the same design. I'm sure it's a coincidence. For the next 3 hours Atari introduced their new equipment. The equipment is discussed elsewhere in this newsletter. A whole series of new Atari commercials were shown. Most are very good. Some are more than very good. One prototype commercial was a knockout.

Various ATARI executive persons took turns at the podium, expounding on their area of expertise. The general impression I got from all this is: ATARI has finally felt the effects of their former habit of resting on their laurels. They have trimmed down to fighting weight. The internal attitude is VERY aggressive, and the plan is to retain the number one position among videogames/personal computers.

The show they put on was very slick, combining live camera work, videotape and slides, along with background music for a well integrated and obviously professionally designed program. The intention of the show was to convince the dealers and distributors ATARI is still worth dealing with, and ATARI will be a major force in the market in the years to come.

ATARI promised to start listening to the dealers and distributors. We were disappointed the user groups were not mentioned, and wondered why we had all been invited to attend. In all fairness, though, we must admit ATARI has gone through some traumatic changes in policy and personnel lately, and the dust hasn't settled yet. Maybe the future will hold a kinder place in ATARI land for user groups.

After returning to the hotel, the ten of us got together in one suite of rooms to discuss the possibilities of an alliance between the larger, better known user groups. We also traded information and impressions we'd gained at the show. Some of us were a bit bothered by the new militaristic attitude displayed by ATARI. My personal impression is they may have over-compensated a bit for their past lethargy. I am all for an assertive marketing attitude, but militarism has no valid place in the computer market. ATARI, are you listening ?

Stopping in Portland, Oregon, I spent the day at the home of Pat Warnhuis, videotaping their bulletin board system. In the evening we went to the general meeting and taped it also. The next day I drove to Eugene with Mark and his camera crew, where we spent the entire day filming people the club has dealt with, as well as filming our general meeting.

That was one of the busiest three days I've ever spent. It was also a very educational trip, and was an excellent opportunity to meet many people whom I had spoken to on the phone. The alliance of the user groups is proceeding cautiously, and we will report on it when we have accomplished more.

—Kirt Stockwell

News and Reviews

by Mike Dunn, Editor

Because Scott Berfield did such a fantastic job of writing about all the new Atari computers, I will not repeat it. **InfoWorld** in the current June 27th issue has a very interesting group of articles about Atari, the new computers and new management, etc., as well as some fantastic news in the column "Inside Track" by John Dvorak. He tells us to expect a really big christmas surprise from Atari — a new computer looking like a hybrid of an Apple III and an Atari 1400, with both 8088 and 6502 CPU chips, dual floppies, RGB output, serial and parallel ports, and compatibity with the present Atari computers, the IBM PC, CP/M and the Apple II!!! All for only $1499 loaded, but no monitor.

ELCOMP, the German-based company with offices in Pomona, CA, (53 Redrock Lane, 91766) have just released several new business programs written in FORTH, so are very memory efficient. There is a **General Business Package** consisting of a mailing list for up to 336 addresses, an inventory control program for up to 478 products and an invoice writing program for up to 36 invoices at a time ($99). If you need more of either, there are **SuperInventory** ($49) for 1000 items and a **SuperMail** ($49) for 500 addresses per disk. ELCOMP also is about to release a new book with lots of machine language subroutines and hardware projects for the Atari.

ATR 8000 News

The ATR8000 (the disk drive/parallel/serial interface with printer buffer and CP/M option) is becoming more and more popular with Atari owners. The company has changed it's name to SWP inc, instead of Software Publishers. They now have the DISKDEF file ready — this is a CP/M menu driven program allowing you to use almost any software from other CP/M based computers on your ATR 8000. They also have a new CP/M manual explaining how to use the ATR CP/M programs. On top of all this, they have lowered the retail price of the 64K model with CP/M to only $500!

For present ATR8000 owners, there is a modification recommended to change two resistors for more efficent operation. To get your new CP/M programs, send your original CP/M and Terminal disks to SWP; also contact them about the resistor changes. Or contact your local ATR dealer —in this area, L.J. Knoll (ACE Computer) at 503-343-5191. Almost ready is a new Atari DOS allowing double-sided disk operation and the Atari RS-232 drivers.

We are still waiting for the 80 column Austin Franklin boards.

HELP

As you may have noticed, our newsletter gets bigger all the time. We have also expanded the Bulletin Board so we now have an ATR8000 with two double-sided, double-density drives, as well as the two Percom double density drives. Because of this and some equipment problems, we are short of money. It is a "cash-flow" problem only. We could increase our subscription rate; it is only $10 year now, or even accept advertising (Ug!) but we don't want to. We have some excellent disks and tapes available, such as the new 1983 #1 disk or tape for only $15 — loaded with good programs from the newsletter, several new education disks for only $10 each, etc. Second side of a disk only $5 more — such as 1982 Xmas disk. Please order some — this will help a lot and then we won't have to to increase our subscription rate. Also, please renew promptly — the code on the mailing label tells you when you started your subscription — eg., 7P2 means you started in July, 1982.

We now have a new program exchange librarian, so send your orders to them: **Ron and Arron Ness, 374 Blackfoot, Eugene, Or 97404,** (503)689-7106. There is also a new list of programs, etc. you can get.

Robert Browning 90 w. Myoak st, Eugene, Or 97404 (503)689-1513, is the new corresponding secretary for the E.R.A.C.E. group; he is a neighbor of the the Ness' and will be helping them with the new education disks and programs.

Bryan's Arcade

O.K. all you Donkey Kong fans, this is what you have all been waiting for. Atari has finally released Donkey Kong for the Atari 400/800 and let me say now it was worth the wait! Donkey Kong has all 4 screens the arcade version has. It has almost the exact same sound affects as the arcade version and it's got the best graphics for a climbing and jumping game I've seen yet. The object of the game, if you don't already know, is to save your sweetheart from Donkey Kong (a big gorilla). You have to guide Mario to the top of the broken down building avoiding barrels, fireballs, oil, and falling from high places. So, if you really like climbing and jumping games, and you like D.K. in the arcades, you will love D.K. for your Atari home computer. Donkey Kong is available on a ROM cartridge for $50.

BUMPAS REVIEWS

COMMBAT, by Adventure International, is probably the most expensive computer game on the commercial market today. Priced at $49.95, the software isn't so bad, but you need two complete computer systems in order to play it. And this very fact is it's greatest attraction.

The scenario is a future universe in which the Galactic Peace Force is able to compel warring planets to conduct their combat entirely within a combat reservation of 4,096 square kilometers. Each belligerant is provided with one Base and 3 Decoys; 8 remotely controlled tanks; 1 ICBM (nuclear-tipped); 4 Drone reconnaisance aircraft; 200 Mines; 200 Anti-Tank Rockets; 250 Tank Shells; 255 Charged Laser Batteries; 100 Units of Shield power; repair facilities; and a Combat Command Console.

The combat reservation is ringed by an impenetrable barrier which will destroy anything touching it. There are no rules other than the limitations of your equipment and the combat reservation. You may make any agreement with your opponent you wish. The winner is the one who first locates and destroys all the opponent's units and his base. Aaron Ness and I have been bombing bases (and decoys!) and shooting tanks to test out this program.

With a MoDem, the game may be played over the telephone with any other player, using Atari, Apple, or TRS-80 computers. The package comes with disks and cassette for each of the three systems. You don't need to buy two software packages just to play one game, either. A back-up copy is easy to make, using Atari DOS. If you play in the same room, you don't even need MoDems. The documentation provides all the information you need to connect the two computers directly by cable. The game supports all common BAUD rates from 110 to 9600. Aaron and his father Ron Ness will test this feature out for next issue.

Half the 24 pages of documentation is used to describe the technical elements of making the various cables to eliminate the MoDem, and loading/operating instructions for the three systems. The Atari version requires a minimum of 24k RAM. The DOS must be modified with a couple of POKEs (the procedure is well described) and an RS-232 handler must be added to the COMMBAT disk. The only problem I had was caused by my usually sloppy reading of the manual. The required POKEs are introduced in a sentence immediately following a sentence which only applies to users who have the MICROCONNECTION MoDem. So I thought I didn't need the POKEs. That is until I found the keyboard locking up on me.

The game shows you nothing about your opponent unless your units detect his units in some manner. Drones may reconnoiter a 7x7 km area. Bases detect enemy units within a 7x7 km area. Tanks and Decoys detect enemy units within a 5x5 km area. Once you detect an enemy unit, the information is never updated unless you update your reconnaisance. Whenever the unit you're operating suffers damage (from mines, etc.), the Command Console screen shudders. You know when you're hit, even without sound. You know only what you can see.

Tanks can carry all items except a Base, ICBM or Drone. Decoys are carried out by Tanks and placed wherever you wish. Each Tank has a limited carrying capacity, but you can "Patch" tanks together. In this way, the one Tank you have selected may also command all Patched Tanks to move or fire just as the selected Tank does.

The Command Console can display one of the 8 Maps into which the Combat Reservation is divided. It simultaneously displays the status of the Base as well as the selected Tank. It also gives you a summary of weapons available. The Base also continuously updates activity within its range, as will the selected Decoy. The bottom of the screen is used to display commands and battle messages (no matter where you are looking at the time, a friendly unit under enemy attack will be reported to you). This area of the screen is also used to display messages between the players (such as "You tell me where your Base is, and I'll tell you mine." Sure you will!)

The documentation is well organized and fully adequate to explain all described functions of the game. The screen graphics are all text figures (i.e., "B" = Base; "D" = Decoy; Tanks are numbers 1 through 8; Mines are "+"; etc.). And you must provide sound with your own imagination. But as a FIRST game in this genre, this is a very exciting development in computer strategy games.

— Jim Bumpas

ANDY ACKS

```
0 REM **********************
1 REM ** ACE NEWSLETTER  **
2 REM ** 3662 VINE MAPLE **
3 REM ** EUGENE. OR 97405**
4 REM **      $10 YR       **
5 REM **********************
10 REM ****************
20 REM *  MATH WARS  *
30 REM * BY A.A.ACKS *
40 REM *IN THE PUBLIC*
50 REM * DOMAIN 4/83 *
60 REM ****************
70 REM INTRO. / MUSIC
80 GRAPHICS 2+16:POSITION 8,2:? #
6;"MATH":POSITION 8,4:? #6;"wars"
:POSITION 9,6:? #6;"BY":POSITION
5,8:? #6;"andrew acks"
90 FOR NOTE=1 TO 16:READ P,D:SOUN
D 0,P,10,10:FOR W=1 TO D:NEXT W:N
EXT NOTE:REM P=PITCH,D=DURATION
100 DATA 121,240,81,480,91,120,96
,120,108,120,60,240,81,480,91,120
,96,120
110 DATA 108,120,60,240,81,480,91
,120,96,120,91,120,108,720
120 SOUND 0,0,0,0:DIM ANS$(1):GRA
PHICS 0:? "DO YOU WANT INSTRUCTIO
N (Y/N)";:INPUT ANS$:IF ANS$="N"
THEN 180
130 IF ANS$<>"Y" THEN 120
140 ? :? " ADD THE NUMBERS AND TY
PE IN THE TOTAL":? "THEN PRESS RE
TURN. IF YOUR ANSWER IS":?
150 ? "CORRECT A MISSILE WILL FIR
E AT THE":? :? "NUMBERS AND THEY
WILL EXPLODE. IF YOUR"
160 ? "ANSWER IS WRONG NOTHING WI
LL HAPPEN.IF":? "THE NUMBERS HIT
THE GROUND THEY WILL":?
170 ? "EXPLODE AND YOU WILL LOSE
A LIFE.AFTER":? "AN EXPLOSION THE
 SCORE WILL BE UPDATED"
180 OPEN #1,4,0,"K:"
190 ? "SKILL LEVEL (1 TO 10)";:IN
PUT S:IF S<>INT(S) OR S<1 OR S>10
 THEN 190:REM S=SKILL LEVEL
200 REM SET UP VARIABLES
210 GRAPHICS 2+16:D=S*5:SCORE=0:L
IVES=5:I1=0:I2=0:Y=2:REM I1 AND I
2 = KEYBOARD INPUT. Y=SCREEN ROW
220 A=INT(D*RND(0)):B=1+INT(D*RND
(0)):Y=2:REM GENERATE TWO NUMBERS
 FOR PROBLEM
230 REM MAIN LOOP
240 POSITION 0,0:? #6;"score ";SC
ORE:POSITION 12,0:? #6;"lives ";L
IVES:FOR I=0 TO 15:REM I=SCREEN C
OLUMN
250 POSITION I,Y:? #6;A;"+";B
260 SOUND 0,40,2,2:SOUND 1,10,2,4
:FOR PAUSE=Y TO 50:NEXT PAUSE:SOU
ND 0,0,0,0:SOUND 1,0,0,0
270 IF I2=0 THEN POSITION 19,10:?
 #6;"     answer =     ":GOTO 300:
REM ERASE ANSWER AT BOTTOM
280 POSITION 19,10:? #6;"     ans
wer = ";I2:REM PRINT KEYBOARD ANS
WER AT BOTTOM OF SCREEN
290 REM LOOK AT KEYBOARD
300 IF PEEK(764)=255 THEN 410
310 I1=0:GET #1,I1
320 IF I1=155 THEN 360
330 IF I2=0 THEN I2=I1-48:GOTO 41
0
340 IF I2>99 THEN 400
350 I2=I1-48+(I2*10):GOTO 410
360 IF I2<>A+B THEN 400
370 REM MISSILE
380 FOR Z=10 TO Y+1 STEP -1:POSIT
ION I+2,Z:? #6;"^":V1=10:SOUND 0,
75-4*Z,10,V1:SOUND 1,78-4*Z,10,V1
*0.7
390 FOR PAUSE=1 TO 15:NEXT PAUSE:
POSITION I+2,Z:? #6;" ":NEXT Z:I2
=0:GOTO 450
400 I2=0
410 POSITION I,Y:? #6;"     ":NEX
T I:Y=Y+1:IF Y=11 THEN 450:REM ER
ASE PROBLEM THEN STEP
420 FOR I=15 TO 0 STEP -1:IF I<>0
 THEN 250
430 Y=Y+1:IF Y<>11 THEN 240:REM E
ND OF MAIN LOOP
440 REM EXPLOSIONS IN INVERSE VID
IO
450 IF Y>10 THEN POSITION I-1,9:?
 #6;"\\!//":POSITION I-1,10:? #6;
"-***-":GOTO 490
460 IF Y=10 THEN POSITION I,9:? #
6;"\\!//":POSITION I,10:? #6;"-**
*-":GOTO 490
465 REM EXPLOSION SOUND FROM ANTI
C OCT/NOV '82 PAGE 11
470 POSITION I,Y-1:? #6;"\\!//":P
OSITION I,Y:? #6;"-***-":POSITION
 I,Y+1:? #6;"//!\\"
480 REM EXPLOSION SOUND FROM ANTI
C OCT/NOV '82 PAGE 11
490 SOUND 2,75,8,15:ICR=0.85:V1=1
5:V2=15:V3=15
500 SOUND 0,20,8,V1:SOUND 1,40,8,
V2:SOUND 2,70,8,V3:V1=V1*ICR:V2=V
2*(ICR+0.05):V3=V3*(ICR+0.08):IF
V3>1 THEN 500
510 SOUND 0,0,0,0:SOUND 1,0,0,0:S
OUND 2,0,0,0:IF Y<10 THEN 550
520 REM ERASE EXPLOSION
530 IF Y>=10 THEN POSITION I-1,9:
? #6;"     ":POSITION I-1,10:?
#6;"     ":IF Y=10 THEN 560
540 POSITION 6,4:? #6;A;"+";B;"="
;A+B:FOR PAUSE=0 TO 700:NEXT PAUS
E:POSITION 6,4:? #6;"     ":GO
TO 560
550 POSITION I,Y-1:? #6;"     ":P
OSITION I,Y:? #6;"     ":POSITION
 I,Y+1:? #6;"     "
560 IF Y=11 THEN LIVES=LIVES-1:Y=
12:IF LIVES=0 THEN POSITION 6,4:?
 #6;"GAME OVER":FOR Q=0 TO 700:NE
XT Q:GOTO 580
570 SCORE=SCORE+12-Y:Y=2:GOTO 220
580 GRAPHICS 0:? :? :? "AGAIN(Y/N
)";:INPUT ANS$:IF ANS$="Y" THEN 1
90
590 CLOSE #1:? "}":? "BASIC":? "I
S";:END
```

stan ockers

```
5010 DATA 173,253,6,133,203,173,2
54,6,133,204,172,255,6,177,203,24
0,28
5012 DATA 141,26,2,238,255,6,200,
177,203,141,0,210,238,255,6,200,1
77,203,13,252,6
5013 DATA 141,1,210,238,255,6,96
5014 DATA 141,255,6,141,1,210,200
,177,203,141,26,2,96
6000 REM most of 1000-2560 remain
s as last month
6010 REM scroll routine slightly
altered
6020 REM ck lines 2105-2110
6030 REM if you have 1000-2560 th
en list to tape or disk
6040 REM and enter after entering
 rest from keyboard.
6050 REM TRY TO LAND ON THE SPECI
AL LANDING PADS
6060 REM WITHOUT CRASHING INTO TH
E BUILDINGS
6070 REM FIRE BUTTON RESTORES HEL
ICOPTER
```

```
31020 ? #6;"          HI          "
;
31025 ? #6:? #6;"   AND WELCOME T
O":? #6:? #6:? #6;"     odd man ou
t.":? #6:? #6;"       plurals"
31030 ? #6:? #6:? #6:? #6;"    by
 w j real":? #6:? #6:? #6:? #6:?
 #6;" ENTER YOUR NAME       NOW
 PLEASE"
31040 INPUT N$:GRAPHICS 18:POKE 7
08,222:POKE 709,142:POKE 711,92:P
OKE 712,20:? #6;"HELLO ";N$:? #6
31100 ? #6:? #6;"  PRESS select F
OR      INSTRUCTIONS":? #6:? #6:?
 #6:? #6;"PRESS start TO START
  THE GAME"
31105 H=0:V=10:RI=0:WR=0
31110 IF PEEK(53279)=5 THEN 3000
31111 IF PEEK(53279)=6 THEN GRAPH
ICS 18:XX=1:GOSUB 999:POKE DL+6,6
:GOTO 1000
31112 GOTO 31110
32000 DIM PR$(50),N$(13):CB=PEEK(106)-
4:POKE 106,CB:PR$(1,41)="hh[illegible]
[illegible]

32010 RESTORE 32760:GRAPHICS 1:Z=
CB*256:A=USR(ADR(PR$),Z,4):FOR W=
Z+472 TO Z+511:READ D:POKE W,D:NE
XT W:POKE 756,CB
32099 DIM TR$(10):TR$="[\[\[\[\]^
":RETURN
32760 DATA 255,73,73,127,127,255,
48,48,252,36,36,60,60,255,24,24
32761 DATA 252,36,37,61,63,255,10
8,108,6,166,255,255,255,255,54,54
32762 DATA 255,128,183,165,165,18
3,128,255
```

PILOT (cont)

by RUTH ELLSWORTH

```
1400 GR:2(DRAW10;TURN90;DRAW20;TU
RN90)
1410 GR:GOTO53,-26;PENYELLOW;TURN
TOO;2(DRAW10;TURN90;DRAW20;TURN90
)
1420 J:*SELPIX
1430 E:
```

-improvements to Titan Lander
by Dale Lutz, June '83 ABB

LANDER CHANGES

```
1 DIM LAN$(25),LT$(19),RT$(19),UP
T$(16),BL$(30),V$(45)
110 IF F(=0 THEN POKE 656,0:POKE
657,23:? "OUT OF FUEL!!":GOTO 114
112 POKE 656,0:POKE 657,26:? "cra
shed!"
114 POKE 656,1:POKE 657,1:? "SCOR
E:";SC;" HI:";HS:POKE 656,1:POKE
657,25:? "PUSH fire";
115 IF STRIG(0)=1 THEN 115
200 POKE 77,0
210 IF YT(0 AND YT)-1.1 THEN POKE
 656,0:POKE 657,26:? "landed":ON
M GOTO 220,230,240,250,260,270
285 SOUND 0,0,0,0:SOUND 1,0,0,0:P
OKE 656,1:POKE 657,5:? "FUEL ";F:
POKE 656,1:POKE 657,22:? "SCORE:"
;SC;" HI:";HS
286 FOR D=1 TO 800:NEXT D:GOTO 32
0
300 SOUND 0,0,0,0:? CHR$(125);:PO
KE 656,0:POKE 657,24:? "out of sk
y!!"
310 FOR D=1 TO 200:NEXT D:POKE 65
6,1:POKE 657,25:? "PUSH fire":GOT
O 115
7002 GRAPHICS 7:GOSUB 10000:POKE
752,1:POKE 559,0
9999 REM CHANGE TEXT AREA TO GR.
1
10000 A=PEEK(560)+256*PEEK(561)
10010 IF PEEK(A)()66 THEN A=A+1:G
OTO 10010
10020 POKE A,70:POKE A+3,6:POKE A
+4,6:POKE A+5,6
10030 RETURN
20000 REM SET UP THE STRINGS TO H
ANDLE PM MOVING
20010 POKE 704,12:POKE 705,54:POK
E 623,24
20020 POKE 706,54:POKE 707,56:POK
E 708,10:POKE 53260,3:POKE 711,22
20025 DIM D$(1),F$((INT(ADR(D$)/2
048)+1)*2048-ADR(D$)-1),PM$(2048)
:POKE 54279,ADR(PM$)/256:POKE 532
77,3
20060 ? CHR$(125)
```

PICNIC!!

Fourth Annual ACE Picnic
Jasper Park

Come to lovely JASPER PARK
on the Willamette River
WEDS, JULY 13 at 6:30 or so

POTLUCK DINNER, ADMISSION PAID
A–E bring desserts
F–K bring casserols
L–Q bring Salads
Q–Z bring chips and dip

PRIZES DONATED BY COMPUTER TUTOR

SEE DEMONSTRATIONS OF

the new TURBO 810 disk drive by the factory

**the new inexpensive BROTHER daisy wheel typewriter/printer*

**the new TAXAN Amber monitor*

Jasper Park is reched by taking Hwy 58 3 miles past Pleasant Hill to the park turnoff, then follow the signs. Your admission has been paid. Come and have a fine time!!

ERACE

THE DIGEST OF SOFTWARE REVIEWS: EDUCATION, edited by Ann Lathrop ($47.95 for individuals; $42.95 for institutions; $52.95 Canada), 1341 Bulldog Lane, Suite C, Fresno, CA 93710.

The goal of The Digest of Software Reviews: Education is to foster critical evaluation in an effort to help teachers select only the best for their students from among the many programs currently available.

The Digest of Software Reviews: Education will be published quarterly. Each issue describes and reviews 50 educational programs. Included in each review are abstracted reviews from all major computer magazines. Thus, a teacher, user group, or parent looking for a good geography program can look up programs under the heading "Social Studies - Geography" and find complete descriptions including program name, cost, system requirements, instructional mode, Dewey decimal classification numbers and Eric descriptors. The abstracted reviews from other computer magazines quickly provide the reader with a feel for program content, as well as educator's reactions to program merit when used with children. These short abstracted reviews also serve as a reference for individuals who might want to locate original reviews quickly.

The February and May issues were sent to us in loose leaf form, complete with 3 holes, ready to be placed in loose-leaf binders. This is useful for schools and groups who want to catalog by subject area or computer type. I'm sure our group will sort out all the Atari software reviews, and happily utilize them in response to the many inquiries we receive asking for help in locating Atari software.

Recently ERACE reviewed COURSEWARE IN THE CLASSROOM, by Lathrop and Goodson. We highly recommend this book, and THE DIGEST OF SOFTWARE REVIEWS: EDUCATION as basic resources for educatorys and individuals involved in the use and selection of educational software.

—Alice Miles Erickson (ERACE)

MATCHBOXES

This is a review of the program MATCHBOXES (Broederbund, $30). This program is really seven different games, all seven games being various forms of the game Concentration.

On the games, you match one picture and tune to a like picture and tune. Game 1 is a simple game of Concentration with the winner being the one with the most matches. The computer keeps track of the score. In game 2, you and your opponent enter words which are hidden behind the puzzle. As the puzzle is solved, parts of the words are exposed. Each of you tries to guess the hidden word the opponent entered. The computer again keeps score and also tells you if you guessed right or wrong. The first one to guess the hidden word wins. Game 3 is like game 2 only the words are entered backwards. In game 4, the letters of the words are scrambled. All of the first four games are played against another person.

For games 5-7, you play against the computer. This time the computer enters the hidden word for you to guess. Game 5 is like game 2. Game 6 has reversed words like game 3. In game 7, the letters of the word are scrambled like in game 4. There are two wild cards in each of the seven games which can be matched with any picture. They are all nice games, and I seem to find no bad qualities whatsoever except I sometimes lose!

I especially like being able to play against another person or against the computer. This varies the game and lets me play even when no one else is around. Also you can choose from various levels of difficulty which makes the games fun for all ages. My eight year old brother really enjoys games 1 and 2.

The only disadvantage I can find with the disk is in the loading process. You can't take the disk out after loading it into the computer —why I don't understand.

I recommend this program for anyone who enjoys the challenge of memory games.

— Wendy Cheldelin, age 10

ERACE UPDATE

ERACE HAS LOGO! Our group has been selected to preview Logo for Atari Corporation. Two members are currently attending Logo workshops at the University of Oregon. They are comparing Apple Logo to Atari Logo. Probably the most unique feature of Atari Logo is the ability to simultaneously use up to four turtles. WOW! A complete review of ATARI LOGO will appear in the next issue of the newsletter.

We are very pleased with the interest shown in the updated ERACE educational disks. Several people have offered to swap their software for ours, so our library is going to grow quickly. We have already received six new programs, one of which is Wayne Real's "Odd Man Out-Plurals"included in this issue. Keep up the work and we'll grow together.

ODD MAN OUT - PLURALS

"Odd Man Out - Plurals", by Wayne Real of Queensland, Australia, is an interesting one player educational program for 5 to 12 year olds. The program requires the basic cartridge, 16K RAM, and one joystick.

The object of the game is to select the plural form of a word created by a different rule than the others. To do so, you maneuver your railway engine opposite your choice and press the fire button. If you are right, the engine will travel across the screen erasing the word. If you are wrong the engine will crash into the word.

"Plurals" is a good example of how a multiple choice drill can be made into an entertaining game. Wayne has done an excellent job in writing this program. He has not only helped learning to be fun, but he has also paid attention to the use of color, sound, screen formatting, and rewards.

His use of color makes the text very easy to read. He uses a variety of colors not only to make the screen look good, but also to improve its readability. Color is used to emphasize particular words and ideas. Look at his instructions to get an idea of how color can enhance text.

Sound in an educational program is a very touchy subject. Programers like to make sure the user gets plenty of audible reward, but educators often find it is distracting to the user and others. One alternative is to allow the user the choice of having the sound played or not. But Wayne has hit a happy medium and effectively uses a minium of sound.

All of text in this program has been formatted to make it easy to read. The use of Graphics 2 makes the letters large enough, spacing is adequate, and the use of color emphasizes needed words and instructions. One improvement might be to use upper and lower case letters. Many educators are beginning to demand screen text be written as it is "in the real world". (And yes, it can be done in Graphics 1 and 2.)

The use of rewards is simple yet adequate. If you are wrong the train crashes and the correct answer is shown. If you are right the train erases the word, the screen flashes, you're given an OK message, and the score changes. Rewards do not need to be fantastic light shows or lengthy musical pieces played in all four voices, but they do need to let the user know how he is doing. Wayne has done a good job of fulfilling those needs. The only negative comment my son had on them, and this is common with many programs, is he wants to see a greater variety of responses.

The use of a joystick for answer input makes it simple for anyone to use the program whether or not they know how to operate the key board. This consideration makes it much easier for most younger users to use a program.

"Plurals" will play endlessly until you press system reset. All programs, educational or not should let you exit in a neat and orderly fashion. You should at least get a "Good bye". Having to press reset or turn the computer off is not a clean way to get out of a program. An endlessly running program can also be less rewarding to the user because no goals have been met. It is quite easy to provide either a preset or user-set goal, and it can make the program seem more worthwhile.

Although "Plurals" has an existing set of words to work from it is easy to customize the list to fit your needs. All you have to do is list the program and change the words in the DATA statements on lines 30010 to 30125. But be sure to also change the number at the beginning of each statement. This number (4,6,8,or 10) is a flag to indicate on which line the correct word is placed on the screen. If the correct answer is the first word the number should be 4; if it's the second, the number is 6 and so on.

Wayne has written a very good program and this is only one of four of his programs we now have. They are all basically the same format, but each covers a different part of grammar. All four programs will be on the ERACE Educational disk 4 when it is completed.

We appreciate your time and your program, Wayne, and we hope it may help others out there who are also trying to write quality work.

Happy learning

—Bob Browning

DeLoy Graham is working on a Master's Project dealing with using microcomputers in home education. He will appreciate hearing from anyone who has experiences, successful or unsuccessful, in teaching with a computer. Useful material might include descriptions of such experiences, names of favorite programs, and sketches of families who are finding computers effective in strengthening skills learned at school, as well as in teaching new material. Please write to him at 475 Lindale Drive #77, Springfield OR 97477.

If you have a special project or a problem you can't solve let us know and we'll try to find the answer or the right contact for you.

Bob Browning is taking over the task of handling the correspondence for ERACE. All further letters and questions about ERACE or educational material should be addressed to him at 90 W. Myoak Dr., Eugene Ore. 97404.

OCKERS

Machine Language Programming #8

Interrupt Programming - System timers

The 'brains' of the Atari, the 6502 CPU, has three pins which cause interrupts when brought low. An interrupt says 'Hey! Stop whatever you are doing, I've got a special task for you'. How does the 6502 find out what the special task is? It goes off to a program telling it what to do (interrupt routine). A 'VECTOR' (two byte address) points to the interrupt routine. Two of the pins causing interrupts are labled NMI (Non Maskable Interrupt) and IRQ (Interrupt Request). The difference is IRQ can be 'masked out', made not to work, by setting a bit in a 6502 register. NMI can't be disengaged (at the 6502). The third pin is RESET which also can't be masked.

We've run into one of the NMI interrupts before, the Vertical Blank Interrupt. Every 1/60th of a second the processor is interrupted to do a lot of updating of registers, (color, timers, joysticks, display list etc.). We even broke in on this process and added our own instructions. This was possible because during the interrupt processing there are a couple of vectors we can change to alter where the program goes next. We changed one of these vectors to point at our own routine, at the end of which we jumped to the place where the vector initially pointed. The other NMI interrupt in the Atari is the Display List Interrupt (DLI). While the VBI and DLI can't be masked at the 6502, they can both be masked at ANTIC. This is sometimes done when you want to speed up the program (and don't care about a blank screen).

An example of an IRQ is the keyboard interrupt. Every time a key is pressed, (exclusive of the break or function keys), the IRQ pin goes low and control is passed to a routine which stores the key value in $02FC (764). There is a vector associated with this interrupt which can be altered if we wish to have something else go on whenever a key is pressed. Another point is since this is an IRQ interrupt it can be masked out at the 6502 with a SEI (Set Interrupt disable) instruction. Unfortunately this disables all IRQ's which include the break key. The keyboard "locks up" and the only way to recover is to hit the RESET key.

IRQ's can be individually enabled (or disabled) by setting bits in a register at $D20E (IRQEN). This is a write only register but the operating sytem keeps a copy (read & write) in POKMSK, $0010 (dec. 16). POKMSK is written into IRQEN during the vertical blank. We normally only change one bit in POKMSK, leaving others unaltered. The highest order bit refers to the break key. Try Poke 16,PEEK(16)-128, making this bit go low; then try the break key. Bit six refers to other keyboard keys. Try POKE 16,PEEK(16)-64.

Another useful interrupt is associated with two of the system timers. There are six system timers total: one three byte; the others two byte. All system timers are updated at 1/60th sec. intervals during the VBI. You may be familiar with the three byte counter at $12,$13 and $14,(RTCLOK). There are also five countdown timers at $0218, $0219 (CDTMV1) thru $0220, $0221 (CDTMV5). Two of these CDTMV1 and CDTMV2 ($021A,$021B) have interrupt vectors associated with them. If they count down and reach zero an IRQ interrupt occurs. Control is vectored thru $0226,27 (CDTMA1) for timer 1 or $0228,29 (CDTMA2) for timer 2. We can make these vectors point to our own routines and do some interesting things.

There are many times we want to do something on a periodic basis but not necessarily every 1/60th of a second. The music routine in 'Old Macdonald' contains counters which had to be updated and checked during each VBI. Wouldn't it be easier to set a timer and use the interrupt to detect when time is up? In the case of the music routine we wanted a falling off of volume at the end of each note. This required the 1/60th second divisions. This should not be necessary for general sounds and the program can be simplified considerably using a timer.

The sound to reproduced is stored in a string as sequential trios of bytes. The first byte specifies the duration of the pitch which follows. The third byte is the loudness. The duration value is loaded into timer 2 and the pitch register is updated. The loudness is mixed with the chosen distortion and passed to the control register. Nothing need be done until the timer reaches zero when the interrupt handles the job of updating things again. If the duration value is zero the routine senses the end of the sound string. The string pointer is reset so it can be used again. The break before the repeat is determined by the size of a non-zero byte following the 0 duration byte. Two zeros in a row means to stop the sound. The sound is initially started by poking a number into the low byte of timer 2, CDTMV2, $021A (dec. 538).

To use this routine a few preparations must be made: 1) The routine itself must be put into a string and the address of the string passed to timer 2 vector CDTMA2 at $0228, $0229 (552, 553 decimal); 2) The sound string must be created with the proper duration, pitch and loudness bytes. End the string with 0,0 and pass the address of the string to $06FD,$06FE (1789, 1790); 3) Decide on the distortion desired and poke $06FC (1788) with the value 16*DIST; 4) Start the sound by poking a 1 into 538. Poke 0 in 538 to stop the sound.

To help generate sound strings, I've written a Basic program. Use a joystick in the left slot to move the cursor to the item you wish to change. Pressing the fire button while moving the joystick changes the item selected. Move the joystick up or down to make small changes and move it left and right to change by amounts of 10. Press any key to play the sound and list out the bytes (in decimal) necessary to create the string. I hope you will find this method of producing sounds useful in your programs

— Stan Ockers

Benioff At Large

Looks at: Electronic Arts

It is an extremely rare occasion when I devote an entire article to one company. But, in this case, it is well worth it. "What company is this?", you ask. It is Electronic Arts of San Mateo, California.

Electronic Arts was founded on the principle that software is not a commodity, but an art form. They call their programmers "artists", and their new product managers are called, "producers". All of this is very strange to an industry which has not considered itself a collection of art works, but instead producers of novelty items.

Electronic Arts was founded by two men from computer industry backgrounds. They were financed by an independent venture capital firm, and what has accumulated is some of the finest "art works" in the industry today.

Electronic Arts sees their position as finding, managing, and supporting their artists. In fact, the artists are true celebrities in the eyes of Electronic Arts. Men and women who have made a great contribution to society.

Electronic Arts' products use up the full capacity of the computers upon which they operate. Sorry 400 owners, you will need 48K and a drive to play any of their products. After all, according to Electronic Arts, the computer is the new creative medium. A painter does not use part of the canvas, he uses all of it.

Ok, it sounds like they are going to have the best products ever introduced at one time, huh? Well, they are. Electronic Arts' products are fantastic, and here is a brief description of each of the initial releases as sent to me by Electronic Arts.

A mule is not a donkey according to Electronic Arts. In their new game, MULE, it stands for: Multiple Use Labor Element. Mule is my favorite game. It begins as you land on the planet Irata with three other creatures. Your mission is to settle the planet, and become self supporting. The game begins as you are given a MULE, and a plot of land. You can equip your MULE with one of three operations. They are: mining, farming, and energy producing. The game continues, and you produce the commodity. You can then buy and sell other commodities according to what you need. It sounds very confusing, but MULE is my favorite EA release. If you like a game of thinking, strategy, and a economics, then Mule is for you. Oh, my advice is to go into energy.

Did you see the scene in Empire Strikes Back, when Luke plays Chewbacca a game of holographic chess? EA simulates this play in their release called ARCHON. It is a battle between the light and dark sides. It has the qualities of an arcade game, a chess game, and a strategy game. Archon was created by the same people who wrote Temple of Apshai. Like all of the EA games, Archon is great. Archon is my second favorite release.

Bill Budge created Raster Blaster well over a year ago. It is a good game, and I like it. But, what if you could create your own pinball game. Put the flippers where you want them. Wouldn't you like that? In Pinball Construction Set, Budge allows you to do this. You can place Bumpers, make drawings, magnify things, and much more. I can't believe the number of options in this game - it is fantastic.

Worms is incredibly wierd. You instuct lines on how to move in patterns. That is all I will say about this one, it's wierd.

EA also released two Apple games. Hard Hat Mack which is similar to Donkey Kong, and Axis Assasin, which is a Tempest. I have not been able to look at these yet, so this all I can tell you.

Well, what can I say. All of these programs are great. I reccommend all of these games, but go to your store and look at them first - you will be flabbergasted. That's a pretty awesome word for a computer game.

TITAN LANDER IN 24K

I recently sent Stan Ockers a copy of Titan Lander and asked him for some suggestions on how I could make the game look a bit more professional and run in 16k. So Stan sent me some fixes for Titan Lander giving it a professional touch and allowing it to fit in 24k. Simply LOAD in the old Titan Lander and type in the changed lines. I'm sure you'll agree the big letters and the use of the trigger to restart the game give Titan an added bit of class.

—Dale Lutz

Holden, Alberta, Canada

```
460 POSITION 29,20:? "L:";D
470 POSITION 39,20:? "!":POSITION
 0,1
480 FOR A=1 TO 490:? ;"*";:IF
STRIG(0)=0 THEN 610
490 IF STICK(0)<>15 THEN 520
500 NEXT A
510 GOTO 350
520 SOUND 0,150,12,12:SOUND 1,151
,12,14
530 POKE 82,2
540 GRAPHICS 0:SETCOLOR 2,0,0:? :
? :? :? "HOW MANY EGGS TO START W
ITH(1-10)";:INPUT D:? :?
550 IF D<1 OR D>10 THEN 540
560 ? "HOW MANY ANTS DO YOU WANT(
1-5)";:INPUT E:? :?
570 IF E<1 OR E>5 THEN 560
580 ? "WHAT LEVEL DO YOU WANT TO
START(1-20)";:INPUT F
590 IF F<1 OR F>20 THEN 580
600 SOUND 0,0,0,0:SOUND 1,0,0,0:C
=0:G=D:H=20:B=0:I=E:D=F:J=1:GOTO
620
610 SOUND 0,0,0,0:SOUND 1,0,0,0:S
OUND 2,0,0,0:SOUND 3,0,0,0:C=0:G=
4:H=20:B=0:I=3:D=1:J=10000
620 REM
630 SOUND 0,0,0,0
640 REM
650 GOSUB 1440
660 GRAPHICS 17:GOSUB 1590:POKE 7
56,K
670 POKE 708,50:POKE 709,0:POKE 7
10,12:POKE 712,150
680 L=0
690 FOR M=1 TO 10
700 N=INT(RND(0)*20):O=INT(24*RND
(4))
710 POSITION N,O:? #6;CHR$(90)
720 POSITION 0,0:? #6;"SCORE:";B
730 POSITION 13,0:? #6;"L:";D
740 POSITION 0,1:? #6;"HIGH SCORE
:";C
750 POSITION 16,1:? #6;"A:";I;"
"
760 POSITION 0,2:? #6;"!!!!!!!!!!
!!!!!!!!!!":IF B>C THEN C=B
770 POSITION N,O:? #6;" ";:NEXT M
780 POSITION N,O:? #6;CHR$(90);
790 SOUND 0,0,0,0:FOR P=1 TO 500:
NEXT P
800 FOR M=1 TO G
810 A=INT(20*RND(4)):Q=INT(24*RND
(4)):LOCATE A,Q,E:IF E<>32 THEN 8
10
820 POSITION A,Q:? #6;CHR$(220);
830 POSITION 0,0:? #6;"SCORE:";B
840 POSITION 13,0:? #6;"L:";D
850 POSITION 0,1:? #6;"HIGH SCORE
:";C
860 POSITION 16,1:? #6;"@:";I
870 POSITION 0,2:? #6;"!!!!!!!!!!
!!!!!!!!!!"
880 A=(RND(1))*10
890 A=INT(20*RND(4)):Q=INT(24*RND
(4)):LOCATE A,Q,E:IF E<>32 THEN 8
90
900 POSITION A,Q:? #6;CHR$(123);
910 NEXT M:SOUND 0,0,0,0:SOUND 1,
0,0,0
920 A=N:Q=O:FOR P=1 TO 500:NEXT P
930 S=14
940 GOSUB 1070:POKE 77,0
950 POSITION 0,0:? #6;"SCORE:";B
960 POSITION 13,0:? #6;"L:";D
970 POSITION 0,1:? #6;"HIGH SCORE
:";C
980 POSITION 16,1:? #6;"A:";I
990 POSITION 0,2:? #6;"!!!!!!!!!!
!!!!!!!!!!":IF B>C THEN C=B
1000 FOR M=1 TO 3
1010 N=INT(RND(0)*20):O=INT(24*RN
D(4)):LOCATE N,O,E:IF E<>220 THEN
 1060
1020 POSITION N,O:? #6;CHR$(252);
:FOR P=64 TO 0 STEP -2:POKE 711,P
:NEXT P:POSITION N,O:? #6;CHR$(12
3);
1030 FOR P=1 TO 2
1040 N=INT(RND(0)*20):O=INT(24*RN
D(4)):LOCATE N,O,E:IF E<>32 THEN
1040
1050 POSITION N,O:? #6;CHR$(220);
:NEXT P:L=L-1
1060 NEXT M:GOTO 940
1070 CC=1000
1080 POSITION A,Q:? #6;CHR$(90);:
T=STICK(0):N=A:O=Q:IF T=15 THEN T
=S
1090 IF PEEK(764)<>255 THEN GOSUB
 1690
1100 S=T:IF T=6 OR T=10 OR T=14 T
HEN Q=Q-1:IF Q<3 THEN Q=23
1110 IF PEEK(764)<>255 THEN GOSUB
 1690
1120 IF T=5 OR T=9 OR T=13 THEN Q
=Q+1:IF Q>23 THEN Q=3
1130 IF PEEK(764)<>255 THEN GOSUB
 1690
1140 IF T=5 OR T=6 OR T=7 THEN A=
A+1:IF A>19 THEN A=0
1150 IF PEEK(764)<>255 THEN GOSUB
 1690
1160 IF T=9 OR T=10 OR T=11 THEN
A=A-1:IF A<0 THEN A=19
1170 IF PEEK(764)<>255 THEN GOSUB
 1690
1180 POSITION N,O:? #6;" ";:LOCAT
E A,Q,E:IF E=220 THEN 1250
1190 SOUND 0,0,0,0
1200 SOUND 0,35,8,14
1210 POSITION A,Q:? #6;CHR$(90);
1220 SOUND 0,0,0,0
1230 IF E=123 THEN 1280
1240 RETURN
1250 B=B+H:L=L+1:SOUND 0,60,6,10:
FOR P=1 TO 5:NEXT P:SOUND 0,0,0,0
1260 IF L=G THEN 1370
1270 GOTO 940
1280 FOR Z=0 TO 255:POKE 708,Z:SO
UND 2,Z,6,14:NEXT Z:POKE 708,14
1290 SOUND 2,49,8,15:FOR W=1 TO 2
00:NEXT W
1300 FOR W=140 TO 0 STEP -4:POKE
712,INT(W/10):SOUND 2,21,8,INT(W/
10):NEXT W
1310 IF B>J THEN 650
1320 IF B<C THEN C=B
1330 IF I>1 THEN I=I-1:GOTO 650
1340 IF I=1 THEN 1350
1350 IF PEEK(53279)=6 OR STRIG(0)
=0 THEN 200
1360 GOTO 1350
1370 D=D+1:H=D*20
1380 IF D>30 THEN D=30
1390 G=G+2:IF G>30 THEN G=30
1400 GRAPHICS 18:FOR M=1 TO 5:SOU
ND 0,200,10,10:POSITION 1,4:? #6;
" all eggs snatched"
1410 POSITION 2,6:? #6;"1500 POIN
T BONUS"
1420 SOUND 0,200,12,12:SOUND 1,20
1,12,14:FOR Y=1 TO 650:NEXT Y
1430 B=B+1500:GOTO 650
1440 GRAPHICS 18:POKE 708,118:POK
E 709,68:POKE 710,200:POKE 711,38
:GOSUB 1590:POKE 756,K
1450 SOUND 0,0,0,0:SOUND 1,0,0,0:
SOUND 2,0,0,0:SOUND 3,0,0,0
1460 POSITION 0,1:? #6;"!!!!!!!!
!!!!!!!"
1470 POSITION 0,2:? #6;"    egg s
natch"
1480 POSITION 0,3:? #6;"!!!!!!!!
!!!!!!!"
1485 POSITION 0,4:? #6;" (C)1983
CSOFTWARE"
```

Fourth Annual ACE Picnic Jasper Park

JULY 13 see page 13

Atari Computer Enthusiasts

A.C.E. is an independent, non-profit and tax exempt computer club and user's group with no connection to the Atari Company, a division of Warner Communication Company. We are a group interested in educating our members in the use of the Atari Computer and in giving the latest News, Reviews and Rumors.

All our articles, reviews and programs come from you, our members.

Our membership is world-wide; membership fees include the A.C.E. Newsletter. Dues are $10 a year for U.S., and $20 a year Overseas Airmail and include about 10 issues a year of the ACE Newsletter.

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Send a business-size SASE to the Ness' for the new, updated ACE Library List!!

Bulletin Board
(503) 343-4352

On line 24 hours a day, except for servicing and updating. Consists of a Tara equipped 48K Atari 400 with a TARA keyboard, 4 double-density disk drives with the ATR 8000, an Atari 825 printer, a Hayes SmartModem; running the ARMUDIC Bulletin Board software written by Frank L. Huband, 1206 N. Stafford St., Arlington, VA 22201. See the Nov '82 issue for complete details.

ATARI COMPUTER ENTHUSIASTS
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